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The White Blood Cell Count is not a Criteria for The Diagnosis of Acute Appendicitis

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SUMMARY

This study was done to evaluate the efficacy of raised white blood cell (WBC) count in the diagnosis of acute appendicitis. This observational, retrospective hospital - based study was conducted at the Department of Paediatrics surgery, Shaikh Zayed Postgraduate Medical Institute, Lahore over a period of two years from January 2000 till December 2001. A total of 180 children age, ranging from 8-13 years (mean 10.5) who presented with clinical features suggestive of acute appendicitis were included in the study. Hematological evaluation was done in all patients to determine the WBC count. As a result of present study it was found that WBC count was raised only in 50% of the patients neutrophil count of 90%. Clinical examination was more diagnostic as compared to laboratory evaluation. In conclusion raised WBC is not an essential laboratory investigation for the diagnosis of acute appendicitis.

INTRODUCTION

Acute appendicitis is undoubtedly the most common surgical emergency with an incidence of 1.5 and 1.9 per 1000 population in males and females respectively.[1] In 1886, Fitz described the pathological sequence of acute inflammation of the appendix, right iliac fossa peritonitis and abscess formation. The life time incidence of appendicitis, once put at 12% in the West, is now falling. The classical explanation for acute appendicitis based on luminal obstruction, venous engorgement, ischemia, suppuration, and gangrenous perforation is challenged by some[2]. It is suggested that physiological changes such as occur in postoperative period may predispose to acute inflammation of the appendix.[2] In children, appendicitis may present as gastroenteritis or acute non-specific abdominal pain such as mesenteric lymphadenitis.[3] In patients with retrocaecal appendicitis, the ureter/bladder may be involved in the inflammatory process leading to dysuria and inflammatory cells in the urine.[2] A polymorphonuclear leukocytosis is present in the vast majority and degree of proteinuria and pyrexia are found in 10-20%.[1]. A low white count should always lead to a review of the diagnosis before operating.

Ultrasonography is also not very helpful in showing the presence of distended appendix-acute appendix[4-6].

Leukocytes form the cellular basis of host defence against the numerous pathogens present in the environment. They can be divided into phagocytic cells, which include neutrophils, monocytes, and eosinophils and non-phagocytic cells, the basophils and lymphocytes. The phagocytic cells and basophils together with lymphocytes fulfil an important role in the modulation of cellular and humoral immunity through the release of immunoregulatory cytokines.[7,8] These cells are also responsible for the ingestion and digestion of cellular and non-cellular debris that otherwise would accumulate during the normal process of cell death and renewal, and also cell death during infections.

The present study was carried out to evaluate the efficacy of raised white blood cell count with neutrophilia in acute appendicitis. WBC count was routinely done in all patients suspected of having acute appendicitis on clinical grounds.

MATERIALS AND METHODS

Hematological evaluation was carried out in all 180 patients to determine the white blood cell count

with granulocytosis, with a clinical suspicion of acute appendicitis on the basis of history like central abdominal pain (paraumbilical) vomiting and physical examination including tenderness and rebound tenderness in RIF, guarding, positive Rovsing's sign and a positive psoas test, of both sexes and age range of 8-13 years admitted to the Department of Paediatric Surgery, Shaikh Zayed Hospital, Lahore.

Children with suspected acute appendicitis, who had received antibiotics prior to the estimation of WBC count were excluded.

Patients with acute appendicitis classically presented with colicky, intermittent pain around the paraumbilical region shifted to right iliac fossa and localized at Mcburney's point (a point 2/3 lateral to the umbilicus to the right anterior superior iliac spine). Anorexia, nausea and vomiting were associated symptoms. Tenderness and rebound tenderness were positive on palpation.

Some patients had positive obturator and psoas test in whom abdominal signs were minimal with an impression of pelvic location of the appendix.

RESULTS

The mean WBC count, the percentage of polymorphs and lymphocytes are shown in Table 1.

Table 1: Laboratory Findings of WBC Count

Total WBCs (n=8,500-13,50)	*Polymorphs % (n=55%)*	*Lymphocytes % (n=38%)*	*No. of patients %*
9.5-9.9 cells/mm^3	82%	10%	36 (20%)
12.0-15.5 cells/mm^3	93%	8%	36 (20%)
8.9-10.2 cells/mm^3	70%	17%	18 (10%)
8.2-9.0 cells/mm^3	60%	19%	45 (25%)
8.0 cells mm^3 or less	57%	27%	45 (25%)

The white blood cell counts of 72 (40%) patients were significantly raised with a granulocytosis of above 90% as shown in Table 1.

The WBC counts were borderline in 18 patients (10%) and normal in 90 (50%) patients.

Histopathology

Ninety percent of specimens sent revealed changes correlating with acute appendicitis (mucosal ulcerations and abundant neutrophils in the submucosa) and 10% reported to have lymphoid follicular hyperplasia (early pathological changes).

DISCUSSION

Acute appendicitis is the most common surgical emergency in patients presenting with acute abdominal conditions. In children presenting with acute abdomen, approximately 40% have acute appendicitis, 55% acute non-specific abdominal pain (mesenteric lymphadenitis, gastroenteritis, amoebiasis, constipation) and 3-5% have acute abdominal emergencies[9] like intestinal obstruction, intussusception etc.

An early diagnosis of acute appendicitis as well as institution of early appendectomy are necessary for reducing morbidity[2]. Despite the advancement in medical technology, the diagnosis of acute appendicitis is based on clinical judgement and therefore a detailed history and careful examination is essential[10]. In acute surgical conditions of the abdomen, ultrasonography has no role in the diagnosis of acute appendicitis[4-6,11,12]. Moreover, children with peritonitis due to appendicular perforation can have normal white blood cell count[13].

The results of this study have shown that WBC count was not a diagnostic criterion for acute appendicitis because it was normal in about 50% of patients and could be raised in other acute non-specific abdominal pains.

A thorough clinical examination was more diagnostic of acute appendicitis than the laboratory evaluation of WBC count.

Prompt diagnosis and early surgical treatment i.e appendectomy is the only standard treatment and morbidity (appendiceal perforation, abscess) has been reduced to less than 1%. Similar other workers in their studies.

CONCLUSION

The raised WBC count with granulocytosis has a sensitivity of only 50% in the diagnosis of acute appendicitis.

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